

LEOTEK Electronics USA LLC

TEST REPORT

SCOPE OF WORK

Intertek Traffic Signal ITE Program Certification Testing
of 15yr 12" Clear and Tinted Red Balls.

REPORT NUMBER

106115934CRT-001R

ISSUE DATE

3-Apr-2025

PAGES

21

DOCUMENT CONTROL NUMBER

NA
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Test Report			
Company Name	LEOTEK Electronics USA LLC	Test Location	Intertek Testing Services NA
Address	1955 Lundy Avenue	Address	3933 US Rt 11
	San Jose, CA 95131		Cortland, NY 13045
			USA
Client Contact	Frank Saltani	Quote Number	Qu-01514892-2
Phone	408-380-1788 Ext. 202	Test Start Date	February 27, 2025
Email	frank@leotek.com	Completion Date	April 2, 2025

Standard(s)
ITE, Circular Signal Supplement, dated June 27, 2005.

Spec.	Test name	Clause	Tinted	Clear
			Result	
ITE	Conditioning	6.4.2	Pass	Pass
ITE	Mechanical Vibration	6.4.3.1	Pass	Pass*
ITE	Temperature Cycling	6.4.3.2	Pass	Pass
ITE	Moisture Resistance	6.4.3.3	Pass	Pass*
ITE	Luminous Intensity	6.4.4.1, 2,3,4	Pass	Pass
ITE	Luminance Uniformity	6.4.4.5	Pass	Pass
ITE	Chromaticity	6.4.4.6	Pass	Pass
ITE	Color Uniformity	6.4.4.7	Pass	Pass
ITE	Lens Abrasion	6.4.5.2	Pass	Pass
ITE	Current Consumption	6.4.6.1	Pass	Pass
ITE	Low Voltage Turn Off	6.4.6.2	Pass**	
ITE	Turn-on/Turn-off Times	6.4.6.3	Pass**	
ITE	Transient Voltage Immunity	6.4.6.4	Pass**	
ITE	Electronic Noise	6.4.6.5	Pass**	
ITE	Power Factor	6.4.6.6	Pass	Pass*
ITE	Total Harmonic Distortion	6.4.6.7	Pass	Pass*
ITE	Load Switch Compatibility	6.4.7.1	Pass**	
ITE	Off State Voltage Decay	6.4.7.2	Pass**	
ITE	Failed State Impedance	6.4.8	Pass**	

*The client states the clear lens model is exactly the same as the tinted model with the exception of the lens. As a result, the electrical testing for the clear is covered by the tinted results.

**Covered under Dialight test report 105772891CRT-002R.

Results Key	
Pass	Compliant
Fail	Non-compliant
TBD	Compliance not determined
NT	Not tested in this project
NA	Test not applicable

John C. Robins

John C. Robins
Engineer
Lighting

Christopher W. Metcalf

Christopher W. Metcalf
Engineering Supervisor
Lighting

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Sample Information				
Date Rec.	Intertek ID	Description	Condition	Model No.
2/17/25	CRT2502170837-004	15yr 12" Red Tinted/Clear Ball	Engineering	See Below

Note: Clear lenses provided.

Further Sample Description

Intertek Sample Number	Description	Model Number	Serial Number
CRT2502170837-004-1	12"Red Ball Tinted	433-1210-003XL15	A2412011878
CRT2502170837-004-2	12"Red Ball Tinted	433-1210-003XL15	A2412011879
CRT2502170837-004-3	12"Red Ball Tinted	433-1210-003XL15	A2412011880
CRT2502170837-004-4	12"Red Ball Clear	433-1270-003XL15	A2412011881
CRT2502170837-004-5	12"Red Ball Clear	433-1270-003XL15	A2412011882
CRT2502170837-004-6	12"Red Ball Clear	433-1270-003XL15	A2412011883

General Requirements

Intertek Sample Number	ETL Cert. Number	Label Identification	Lens Orientation	Color Coded Wires
CRT2502170837-004-1	NA	Pass	Pass	Red/White
CRT2502170837-004-2	NA	Pass	Pass	Red/White
CRT2502170837-004-3	NA	Pass	Pass	Red/White
CRT2502170837-004-4	NA	Pass	Pass	Red/White
CRT2502170837-004-5	NA	Pass	Pass	Red/White
CRT2502170837-004-6	NA	Pass	Pass	Red/White

General Requirements

Intertek Sample Number	600V / 20 AWG Min.	Wire Length ≥ 39"	Service Rating +105°C
CRT2502170837-004-1	600V / 18 AWG	Pass	Pass
CRT2502170837-004-2	600V / 18 AWG	Pass	Pass
CRT2502170837-004-3	600V / 18 AWG	Pass	Pass
CRT2502170837-004-4	600V / 18 AWG	Pass	Pass
CRT2502170837-004-5	600V / 18 AWG	Pass	Pass
CRT2502170837-004-6	600V / 18 AWG	Pass	Pass

Sample Modification Log	
Date	Modification description
2/21/25	AC Cable: Red/White_C-G000000016
	Wire Cover : C-A000000097
	Waterproof Plug
	Back Cover: C-A000000096
	Heat Sink: C-A000000095
	Metal PCB: C-E000000013
	Connector: CNRP4-A2001WRBS04P
	LED: LEDLXR-NCSR219BT
	Thermistor: C-F000000023
	2nd Lens: PPCTSL-LENS009B1
	SPS:_15y SPS_C-D000000001
	Power Clip_C-A000000092
	Fresnel Lens: PPCTSL-FL08A
	O-ring:_12" _PRBTSL-LG1206
	Gasket:_12" Gasket_PRBTSL-FG12T1
	Front Cover Tinted: PPCTSL-FC12RV1Z
	Front Cover Clear: PPCTSL-FC12WV1Z

Picture(s)



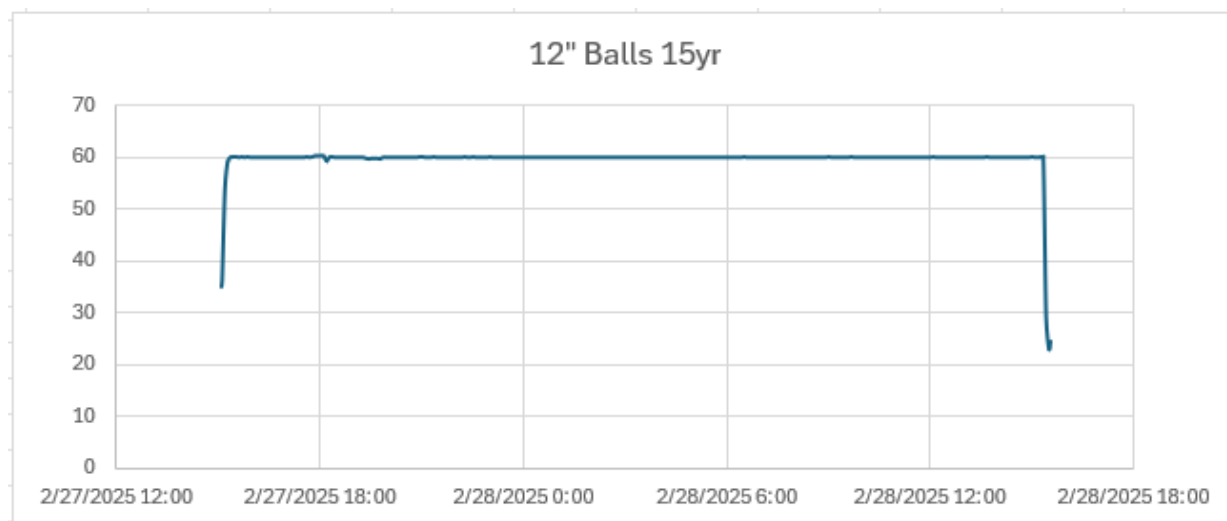
Note: The client supplied clear lenses for the modules, The clear lens model number is 433-1270-003XL15.

Conditioning 6.4.2

The submitted LED signal modules were subjected to conditioning prior to the environmental tests. The samples were energized for a minimum of 24 hours, at 100% duty cycle in an ambient temperature of +60°C (+140°F). At the conclusion of the test, the modules shall be visually inspected for damage and checked for proper operation.

Results

Intertek Sample Number	Description	Visual Inspection		Operational Check	
CRT2502170837-004-1	12"Red Ball Tinted	Pass	Pass	Pass	Pass
CRT2502170837-004-2	12"Red Ball Tinted	Pass	Pass	Pass	Pass
CRT2502170837-004-3	12"Red Ball Tinted	Pass	Pass	Pass	Pass
CRT2502170837-004-4	12"Red Ball Clear	Pass	Pass	Pass	Pass
CRT2502170837-004-5	12"Red Ball Clear	Pass	Pass	Pass	Pass
CRT2502170837-004-6	12"Red Ball Clear	Pass	Pass	Pass	Pass



Measured Voltage: 120 - 122 Vac

Complies: ☒ YES ☐ NO

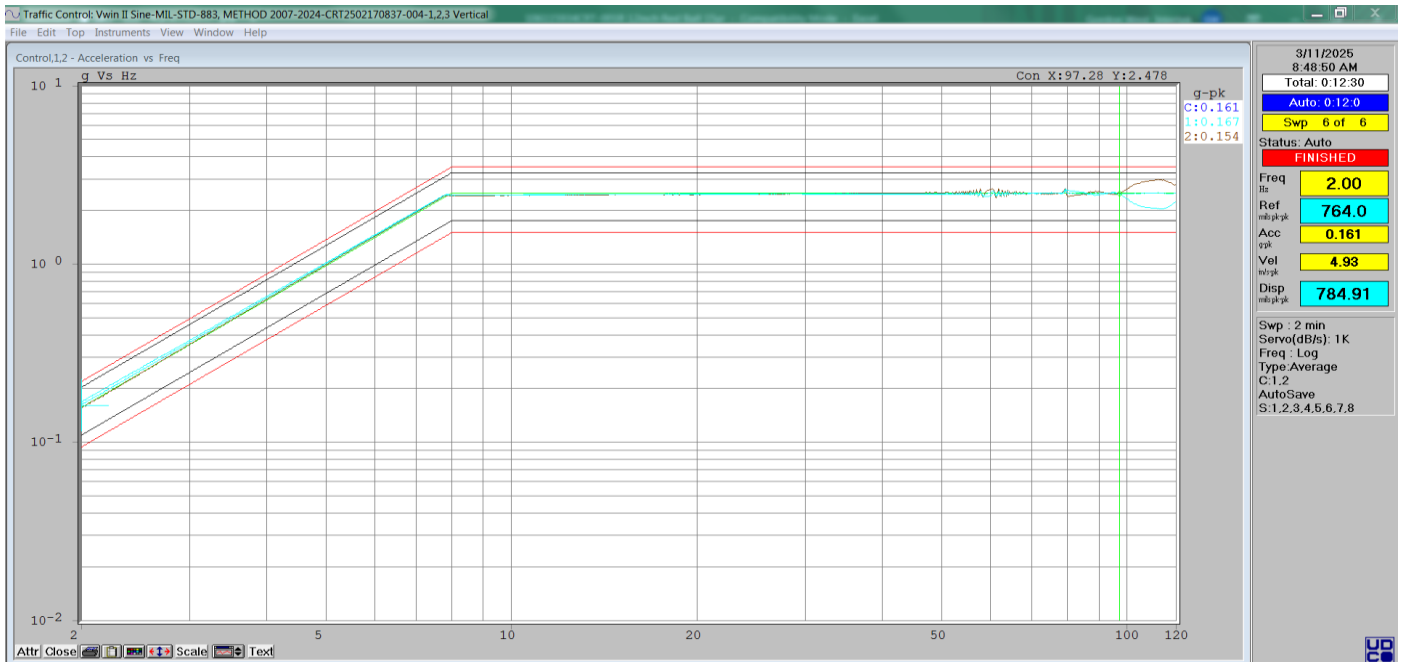
Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	1,2	Completion Date:	28-Feb-2025
Amb (°C):	NA	RH%	NA

Mechanical Vibration 6.4.3.1

The submitted LED signal modules were securely mounted in traffic signal housings and vibrated along each axes for three 4 minute sweep cycles at a displacement of 0.764" from 2 to 8 Hz and 2.5 Gs from 8 to 120 Hz. Testing was conducted in accordance with MIL-STD-883, method 2007. At the conclusion of the test, the modules shall be visually inspected for damage and checked for proper operation.

Results

Intertek Sample Number	Description	x-axis lateral	y-axis horizontal	z-axis vertical	Visual Inspection	Operational Check
CRT2502170837-004-1	12"Red Ball Tinted	X	X	X	Pass	Pass
CRT2502170837-004-2	12"Red Ball Tinted	X	X	X	Pass	Pass
CRT2502170837-004-3	12"Red Ball Tinted	X	X	X	Pass	Pass
CRT2502170837-004-4	12"Red Ball Clear	X	X	X	Pass	Pass
CRT2502170837-004-5	12"Red Ball Clear	X	X	X	Pass	Pass
CRT2502170837-004-6	12"Red Ball Clear	X	X	X	Pass	Pass



Complies: ☒ YES ☐ NO

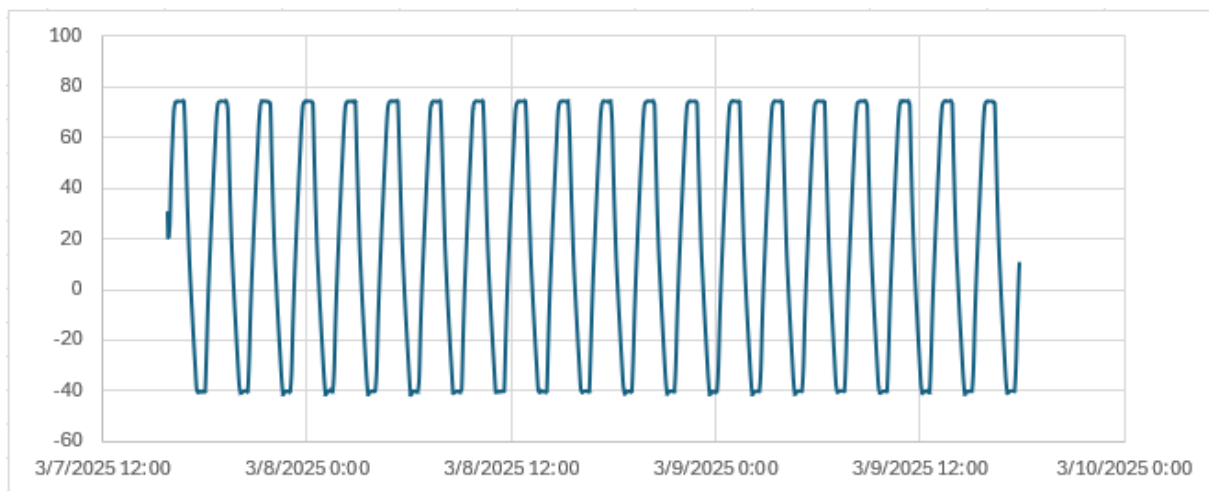
Tested By:	Gordon West	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	10,11,12,13,14	Completion Date:	11-Mar-2025
Amb (°C):	22.8	RH%	43

Temperature Cycling 6.4.3.2

The submitted tinted and clear LED signal modules were subjected to temperature cycling according to MIL-STD-883, Method 1010. Twenty cycles were performed with a 30 minute transfer time between temperature extremes and a 30 minute dwell time at the extremes. The temperature cycled between -40°C and +74°C. The samples were non-operating. At the conclusion of the test, the module shall be free of damage and moisture and be fully operational.

Results

Intertek Sample Number	Description	Visual Inspection	Operational Check
CRT2502170837-004-1	12"Red Ball Tinted	Pass	Pass
CRT2502170837-004-2	12"Red Ball Tinted	Pass	Pass
CRT2502170837-004-3	12"Red Ball Tinted	Pass	Pass
CRT2502170837-004-4	12"Red Ball Clear	Pass	Pass
CRT2502170837-004-5	12"Red Ball Clear	Pass	Pass
CRT2502170837-004-6	12"Red Ball Clear	Pass	Pass



Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	1	Completion Date:	9-Mar-2025
Amb (°C):	NA	RH%:	NA

Moisture Resistance 6.4.3.3

The submitted tinted and clear LED signal modules were subjected to the rain and blowing rain test per MIL-STD-810F, Test Method 506.4, Procedure I. The test was performed on standalone modules without a protective housing. The rainfall rate was 1.7 mm/min (4in/hr) and the droplet size shall predominantly be between 0.5mm and 4.5mm (0.02 to 0.18 in). The samples were oriented such that the lens is directed towards the wind source when at a zero rotation angle. The samples were rotated at a rate of 4 degrees per minute along the vertical axis, from an orientation of -60 to +60 degrees during the test. The duration of the test is 30 minutes, and the samples were energized throughout the test. The water temperature was $25^{\circ} \pm 5^{\circ}\text{C}$ ($77^{\circ} \pm 9^{\circ}\text{F}$) and the wind velocity was 80 km/hr (50 mph). At the conclusion of the test, the module shall be free of damage and moisture and be fully operational.

Results

Intertek Sample Number	Description	Visual Inspection	Operational Check
CRT2502170837-004-1	12"Red Ball Tinted	No moisture or damage	Operates as expected
CRT2502170837-004-2	12"Red Ball Tinted	No moisture or damage	Operates as expected
CRT2502170837-004-3	12"Red Ball Tinted	No moisture or damage	Operates as expected
CRT2502170837-004-4	12"Red Ball Clear	No moisture or damage	Operates as expected
CRT2502170837-004-5	12"Red Ball Clear	No moisture or damage	Operates as expected
CRT2502170837-004-6	12"Red Ball Clear	No moisture or damage	Operates as expected

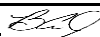
Requirement: Signal Still Operational and No Moisture In The Housing

Intertek Sample Number	Sample Temp. at start (°C)	Water Temperature 25C +/- 5C			
		Start	10 minutes	20 minutes	30 minutes
CRT2502170837-004-1	42.3	27.5	27.6	28.1	29.0
CRT2502170837-004-2	42.3	27.5	27.6	28.1	29.0
CRT2502170837-004-3	41.9	29.0	26.0	25.6	25.0
CRT2502170837-004-4	41.9	29.0	26.0	25.6	25.0
CRT2502170837-004-5	43.5	25.0	24.2	24.3	24.5
CRT2502170837-004-6	43.5	25.0	24.2	24.3	24.5

* Water temperature is °C

Recorded rainfall rate:	4.3	in/hr
Recorded wind velocity:	48-52	mph

Complies: ☒ YES ☐ NO

Tested By:	Brittany James	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	15, 16, 17, 18, 19	Completion Date:	21-Mar-2025
Amb (°C):	N/A	RH%	N/A

Luminous Intensity 6.4.4.1 through 6.4.4.4

The intensity distribution tests on the submitted LED traffic signal modules were performed with the Intertek 25 meter Gonio photometer. The Gonio photometer was in accordance with the goniometer described in Section 11.02 (Test Apparatus) of the Institute of Transportation Engineers' Vehicle Traffic Control Signal Heads Standard Test Method. The calibration of the Gonio photometer is traceable to the National Institute of Standards and Technology. The LED modules were operated at 120 volts AC. The alignment of the LED module was performed in accordance with Section 11.03 (Alignment of Optical Unit for Test) of the Institute of Transportation Engineers' Vehicle Traffic Control Signal Heads Standard Test Method. The submitted LED signal modules were tested for maintained minimum luminous intensity at each of 78 points indicated in Table 1, of the referenced specification. These measurements were recorded at an ambient temperature of 25°C. The green LED signal modules were energized at nominal operating voltage, at a 100% duty cycle for 60 minutes.

A relative luminous intensity measurement is taken in a region from 0 to 7.5° down, and from 7.5° left to 7.5° right. The measurement is taken at 80 Vac, 120 Vac and 135 Vac. When the 80 Vac and 135 Vac factors are applied to the photometric data the units shall still meet the photometric requirements of each model.

A diminution factor was measured by using the submitted samples. The modules were mounted in a dual compartment temperature chamber with the lensed portion in one compartment and all portions behind the lens within the other compartment. At room ambient temperature (both inside and outside the chamber) and in calm air outside the chamber, the modules were energized per the conditions described above and a single on-axis reading (IA) taken and recorded. With the modules off, the chamber was heated to 74°C behind the lens and 49°C in front of the lens, and allowed to stabilize. Following stabilization, the modules were energized per the above cycle and the single on-axis reading (IH) taken and recorded. A diminution factor was calculated (IH/IA). The readings recorded initially were factored by the diminution factor.

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample	CRT2502170837-004-1					Target Input voltage		Measured Input Voltage		H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball					80Vac		80.0 Vac		569.3 Candela		0.976		0.714
Color:	Red					120Vac		120.1 Vac		583.1 Candela		1.000		
Lens Type:	Tinted					135Vac		135.1 Vac		595.2 Candela		1.021		
Photometric Test Distance: 25 meters														
Max	1095	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
12.5U	2.5	95	96	98	98	100	100	68	68	70	70	71	71	37
12.5U	7.5	83	85	85	87	87	88	60	60	61	62	62	63	29
7.5U	2.5	157	159	161	162	164	166	112	113	115	116	117	118	69
7.5U	7.5	131	135	134	138	137	141	93	96	96	99	98	101	55
7.5U	12.5	95	99	97	101	99	103	68	70	69	72	71	74	40
2.5U	2.5	349	350	357	358	365	366	249	250	255	256	260	261	150
2.5U	7.5	288	291	295	298	301	304	206	207	211	212	215	217	124
2.5U	12.5	207	206	212	211	217	216	148	147	151	151	155	154	84
2.5U	17.5	130	125	133	128	136	131	93	89	95	91	97	93	47
2.5U	22.5	72	70	74	71	75	73	51	50	53	51	54	52	26
2.5D	2.5	732	743	750	761	765	777	522	530	535	543	546	554	358
2.5D	7.5	610	621	625	636	637	649	435	443	446	454	455	463	292
2.5D	12.5	437	447	448	458	457	467	312	319	320	327	326	334	201
2.5D	17.5	274	272	281	279	287	285	196	195	200	199	205	203	117
2.5D	22.5	152	150	156	154	159	157	108	107	111	110	113	112	62
2.5D	27.5	68	71	70	73	71	75	49	51	50	52	51	53	33
7.5D	2.5	599	607	614	622	626	634	428	433	438	444	447	453	281
7.5D	7.5	490	518	502	531	512	542	350	370	358	379	366	387	234
7.5D	12.5	345	375	354	385	361	393	247	268	253	275	258	280	157
7.5D	17.5	213	233	218	239	222	244	152	167	156	171	159	174	91
7.5D	22.5	117	132	120	136	122	138	84	94	86	97	87	99	47
7.5D	27.5	57	64	58	66	59	67	40	46	41	47	42	48	26
12.5D	2.5	227	232	233	237	237	242	162	165	166	169	169	173	110
12.5D	7.5	188	197	193	202	197	206	134	141	138	144	140	147	88
12.5D	12.5	130	143	134	146	136	149	93	102	95	104	97	106	62
12.5D	17.5	82	92	84	94	86	96	59	66	60	67	61	69	37
12.5D	22.5	49	55	50	56	51	58	35	39	36	40	36	41	18
12.5D	27.5	28	31	29	31	29	32	20	22	20	22	21	23	11
17.5D	2.5	114	114	117	117	119	119	81	81	83	83	85	85	51
17.5D	7.5	99	99	101	101	103	103	70	71	72	72	74	74	40
17.5D	12.5	74	74	75	76	77	77	53	53	54	54	55	55	29
17.5D	17.5	51	52	52	53	53	54	36	37	37	38	38	39	15
17.5D	22.5	34	35	35	36	36	36	24	25	25	25	25	26	7
22.5D	2.5	85	84	87	86	89	88	61	60	62	62	63	63	37
22.5D	7.5	71	68	72	70	74	71	50	49	52	50	53	51	29
22.5D	12.5	51	49	52	51	53	52	36	35	37	36	38	37	22
22.5D	17.5	34	35	35	36	35	36	24	25	25	25	25	26	11
27.5D	2.5	45	44	46	46	47	46	32	32	33	32	34	33	26
27.5D	7.5	38	39	39	40	40	41	27	28	28	29	28	29	18

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-004-2				Target Input voltage		Measured Input Voltage		H, V Lum. Intensity		Vac Variation Factor		MMLI Factor	
Module	12" Ball				80Vac		80.0 Vac		572.1 Candela		0.981		0.695	
Color:	Red				120Vac		120.0 Vac		583.2 Candela		1.000			
Lens Type:	Tinted				135Vac		135.1 Vac		593.2 Candela		1.017			
Photometric Test Distance: 25 meters														
Max	1095	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
12.5U	2.5	95	95	96	97	98	99	66	66	67	68	68	69	37
12.5U	7.5	83	85	85	87	86	88	58	59	59	60	60	61	29
7.5U	2.5	159	161	162	164	164	167	110	112	112	114	114	116	69
7.5U	7.5	132	138	135	141	137	143	92	96	94	98	95	99	55
7.5U	12.5	95	101	97	103	99	105	66	70	68	72	69	73	40
2.5U	2.5	351	356	358	363	364	370	244	248	249	253	253	257	150
2.5U	7.5	284	304	290	310	294	315	197	211	201	215	205	219	124
2.5U	12.5	197	220	201	225	205	228	137	153	140	156	142	159	84
2.5U	17.5	120	137	122	140	124	142	83	96	85	97	87	99	47
2.5U	22.5	66	76	67	78	69	79	46	53	47	54	48	55	26
2.5D	2.5	741	744	755	758	768	771	515	517	525	527	534	536	358
2.5D	7.5	610	632	622	644	632	655	424	440	432	448	440	456	292
2.5D	12.5	436	460	444	469	452	477	303	320	309	326	314	332	201
2.5D	17.5	268	285	273	290	278	295	186	198	190	202	193	205	117
2.5D	22.5	148	159	151	162	153	164	103	110	105	112	106	114	62
2.5D	27.5	65	77	67	78	68	79	45	53	46	54	47	55	33
7.5D	2.5	631	620	643	632	654	643	439	431	447	440	455	447	281
7.5D	7.5	533	513	543	523	553	532	371	357	378	363	384	370	234
7.5D	12.5	384	361	391	368	398	375	267	251	272	256	277	261	157
7.5D	17.5	239	222	244	226	248	230	166	154	170	157	172	160	91
7.5D	22.5	133	123	136	125	138	128	93	86	95	87	96	89	47
7.5D	27.5	65	59	66	60	67	61	45	41	46	42	47	43	26
12.5D	2.5	243	238	248	242	252	247	169	165	172	169	175	171	110
12.5D	7.5	207	195	211	199	215	202	144	136	147	138	149	141	88
12.5D	12.5	149	137	152	139	155	142	104	95	106	97	108	98	62
12.5D	17.5	95	85	97	87	99	88	66	59	68	60	69	61	37
12.5D	22.5	55	50	57	51	58	52	39	35	39	36	40	36	18
12.5D	27.5	31	28	32	29	32	29	22	20	22	20	22	20	11
17.5D	2.5	117	117	119	119	121	121	81	81	83	83	84	84	51
17.5D	7.5	101	102	103	104	104	105	70	71	71	72	73	73	40
17.5D	12.5	75	75	76	77	78	78	52	52	53	53	54	54	29
17.5D	17.5	51	52	52	53	53	54	36	36	36	37	37	37	15
17.5D	22.5	34	34	35	35	36	36	24	24	24	24	25	25	7
22.5D	2.5	85	87	87	89	88	90	59	60	60	62	61	63	37
22.5D	7.5	70	71	72	72	73	73	49	49	50	50	51	51	29
22.5D	12.5	50	51	51	52	52	53	35	35	36	36	36	37	22
22.5D	17.5	34	34	35	35	35	35	24	24	24	24	25	25	11
27.5D	2.5	46	46	47	46	48	47	32	32	33	32	34	33	26
27.5D	7.5	40	39	40	40	41	41	27	27	28	28	29	28	18

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-004-3				Target Input voltage		Measured Input Voltage			H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball				80Vac		80.0 Vac			570.1 Candela		0.980		0.720
Color:	Red				120Vac		120.0 Vac			581.5 Candela		1.000		
Lens Type:	Tinted				135Vac		135.2 Vac			591.7 Candela		1.018		
Photometric Test Distance: 25 meters														
Max	1095	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
12.5U	2.5	95	96	97	98	98	100	68	69	70	71	71	72	37
12.5U	7.5	82	87	84	89	85	90	59	63	60	64	61	65	29
7.5U	2.5	156	160	160	163	162	166	113	115	115	118	117	120	69
7.5U	7.5	129	139	132	141	134	144	93	100	95	102	97	104	55
7.5U	12.5	93	103	94	105	96	106	67	74	68	75	69	77	40
2.5U	2.5	344	357	351	364	357	371	248	257	253	262	257	267	150
2.5U	7.5	275	309	280	315	285	320	198	222	202	227	205	231	124
2.5U	12.5	188	228	192	233	195	237	135	164	138	168	141	171	84
2.5U	17.5	114	143	116	146	118	148	82	103	84	105	85	107	47
2.5U	22.5	63	81	64	83	65	85	45	59	46	60	47	61	26
2.5D	2.5	724	750	739	765	752	779	521	540	532	551	541	561	358
2.5D	7.5	589	642	601	654	611	666	424	462	432	471	440	479	292
2.5D	12.5	416	476	424	486	432	494	299	343	305	349	311	356	201
2.5D	17.5	255	294	260	300	264	305	183	211	187	216	190	219	117
2.5D	22.5	137	166	140	169	142	172	99	119	100	122	102	124	62
2.5D	27.5	61	80	62	81	63	83	44	58	44	59	45	60	33
7.5D	2.5	604	598	616	610	626	621	435	431	443	439	451	447	281
7.5D	7.5	508	497	518	507	527	515	366	357	373	365	380	371	234
7.5D	12.5	365	357	373	364	379	370	263	257	268	262	273	266	157
7.5D	17.5	228	215	233	220	237	223	164	155	168	158	171	161	91
7.5D	22.5	126	121	129	123	131	125	91	87	93	89	94	90	47
7.5D	27.5	61	58	62	59	64	60	44	42	45	43	46	44	26
12.5D	2.5	231	226	236	231	240	235	166	163	170	166	173	169	110
12.5D	7.5	198	185	202	189	205	193	142	134	145	136	148	139	88
12.5D	12.5	143	131	146	134	148	136	103	94	105	96	107	98	62
12.5D	17.5	92	82	94	84	95	85	66	59	67	60	68	62	37
12.5D	22.5	54	49	55	50	56	51	39	35	40	36	40	37	18
12.5D	27.5	30	28	31	28	31	29	22	20	22	20	23	21	11
17.5D	2.5	113	114	115	117	117	119	81	82	83	84	85	85	51
17.5D	7.5	97	100	99	102	101	104	70	72	71	73	73	75	40
17.5D	12.5	72	75	73	77	75	78	52	54	53	55	54	56	29
17.5D	17.5	49	51	50	52	51	53	36	37	36	38	37	38	15
17.5D	22.5	33	35	34	35	35	36	24	25	24	25	25	26	7
22.5D	2.5	83	86	85	88	86	89	60	62	61	63	62	64	37
22.5D	7.5	67	71	69	73	70	74	49	51	49	52	50	53	29
22.5D	12.5	48	51	49	52	50	53	35	37	35	38	36	38	22
22.5D	17.5	33	34	34	35	34	35	24	25	24	25	25	26	11
27.5D	2.5	44	44	45	45	46	46	32	32	33	32	33	33	26
27.5D	7.5	38	38	39	39	39	40	27	28	28	28	28	29	18

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-004-4				Target Input voltage		Measured Input Voltage			H, V Lum. Intensity		Vac Variation Factor		MMLI Factor
Module	12" Ball				80Vac		80.0 Vac			578.7 Candela		0.977		0.745
Color:	Red				120Vac		120.1 Vac			592.5 Candela		1.000		
Lens Type:	Clear				135Vac		135.1 Vac			593.9 Candela		1.002		
Photometric Test Distance: 25 meters														
Max	1095	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
12.5U	2.5	97	99	100	101	100	101	73	74	74	75	74	75	37
12.5U	7.5	85	88	87	90	88	91	64	66	65	67	65	67	29
7.5U	2.5	162	165	166	169	167	169	121	123	124	126	124	126	69
7.5U	7.5	135	142	139	145	139	146	101	106	103	108	103	108	55
7.5U	12.5	98	104	100	107	100	107	73	78	74	80	75	80	40
2.5U	2.5	356	363	364	372	365	373	265	271	271	277	272	278	150
2.5U	7.5	286	310	293	318	294	319	213	231	218	237	219	237	124
2.5U	12.5	199	226	204	232	204	232	148	169	152	173	152	173	84
2.5U	17.5	121	141	124	145	124	145	90	105	92	108	93	108	47
2.5U	22.5	67	80	69	82	69	82	50	59	51	61	51	61	26
2.5D	2.5	757	767	776	785	777	787	564	571	577	585	579	586	358
2.5D	7.5	622	652	637	667	639	669	463	485	474	497	475	498	292
2.5D	12.5	444	477	455	489	456	490	331	355	338	364	339	365	201
2.5D	17.5	274	296	281	303	281	304	204	221	209	226	210	226	117
2.5D	22.5	150	165	153	169	153	169	111	123	114	126	114	126	62
2.5D	27.5	67	80	68	82	68	82	50	60	51	61	51	61	33
7.5D	2.5	644	635	660	651	661	652	480	473	491	484	492	486	281
7.5D	7.5	542	526	555	539	556	540	404	392	413	401	414	402	234
7.5D	12.5	391	371	401	380	402	381	291	276	298	283	299	284	157
7.5D	17.5	244	228	250	233	250	234	182	170	186	174	187	174	91
7.5D	22.5	137	126	140	129	140	129	102	94	104	96	104	96	47
7.5D	27.5	66	61	68	63	68	63	49	46	51	47	51	47	26
12.5D	2.5	248	243	254	249	255	250	185	181	189	185	190	186	110
12.5D	7.5	212	200	217	204	217	205	158	149	161	152	162	152	88
12.5D	12.5	152	140	156	143	156	143	113	104	116	106	116	107	62
12.5D	17.5	97	87	100	89	100	89	72	65	74	66	74	67	37
12.5D	22.5	57	52	58	53	58	53	42	39	43	40	43	40	18
12.5D	27.5	32	29	33	30	33	30	24	22	24	22	24	23	11
17.5D	2.5	120	121	123	124	124	124	90	90	92	92	92	93	51
17.5D	7.5	103	105	106	107	106	108	77	78	79	80	79	80	40
17.5D	12.5	77	78	79	80	79	80	57	58	59	59	59	60	29
17.5D	17.5	53	54	54	55	54	55	39	40	40	41	40	41	15
17.5D	22.5	36	36	36	37	36	37	26	27	27	27	27	28	7
22.5D	2.5	88	91	91	93	91	93	66	68	67	69	68	69	37
22.5D	7.5	73	74	74	76	75	76	54	55	55	56	56	57	29
22.5D	12.5	52	53	53	54	54	55	39	40	40	41	40	41	22
22.5D	17.5	36	36	36	37	36	37	26	27	27	27	27	27	11
27.5D	2.5	48	47	49	49	49	49	36	35	37	36	37	36	26
27.5D	7.5	41	41	42	42	42	42	31	31	31	31	31	31	18

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-004-5				Target Input voltage		Measured Input Voltage		H, V Lum. Intensity		Vac Variation Factor		MMLI Factor	
Module:	12" Ball				80Vac		80.0 Vac		598.0 Candela		0.982		0.720	
Color:	Red				120Vac		120.1 Vac		609.2 Candela		1.000			
Lens Type:	Clear				135Vac		135.1 Vac		619.8 Candela		1.017			
Photometric Test Distance: 25 meters														
Max	1095	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
12.5U	2.5	99	100	101	102	103	104	71	72	73	74	74	75	37
12.5U	7.5	86	91	88	93	89	94	62	65	63	67	64	68	29
7.5U	2.5	165	168	168	171	171	174	119	121	121	123	123	125	69
7.5U	7.5	136	145	139	147	141	150	98	104	100	106	102	108	55
7.5U	12.5	98	107	99	109	101	111	70	77	72	79	73	80	40
2.5U	2.5	365	377	372	384	378	391	263	271	268	276	272	281	150
2.5U	7.5	293	326	299	332	304	337	211	234	215	239	219	243	124
2.5U	12.5	201	238	205	243	209	247	145	172	148	175	150	178	84
2.5U	17.5	123	150	125	153	127	155	88	108	90	110	92	112	47
2.5U	22.5	67	85	68	86	69	88	48	61	49	62	50	63	26
2.5D	2.5	765	790	780	805	793	819	551	568	561	579	571	589	358
2.5D	7.5	627	677	639	690	650	702	451	487	460	496	468	505	292
2.5D	12.5	445	498	454	507	462	516	321	358	327	365	332	371	201
2.5D	17.5	274	311	280	317	284	322	197	224	201	228	205	232	117
2.5D	22.5	148	173	151	177	153	180	106	125	108	127	110	129	62
2.5D	27.5	65	83	66	85	67	86	47	60	48	61	48	62	33
7.5D	2.5	648	644	660	656	671	667	466	463	475	472	483	480	281
7.5D	7.5	543	534	553	544	563	553	391	384	398	391	405	398	234
7.5D	12.5	388	380	396	387	403	394	280	274	285	279	290	284	157
7.5D	17.5	244	232	248	236	252	240	175	167	179	170	182	173	91
7.5D	22.5	134	130	136	133	138	135	96	94	98	95	100	97	47
7.5D	27.5	64	62	65	64	66	65	46	45	47	46	48	47	26
12.5D	2.5	248	243	252	248	257	252	178	175	181	178	185	181	110
12.5D	7.5	211	198	215	202	218	206	152	143	154	146	157	148	88
12.5D	12.5	150	140	153	143	156	145	108	101	110	103	112	104	62
12.5D	17.5	96	87	97	89	99	91	69	63	70	64	71	65	37
12.5D	22.5	56	52	57	53	58	54	40	37	41	38	42	39	18
12.5D	27.5	31	29	31	30	32	30	22	21	23	21	23	22	11
17.5D	2.5	120	121	122	124	124	126	86	87	88	89	89	90	51
17.5D	7.5	102	105	104	107	106	109	74	76	75	77	76	78	40
17.5D	12.5	75	78	77	80	78	81	54	56	55	57	56	58	29
17.5D	17.5	52	53	52	54	53	55	37	38	38	39	38	40	15
17.5D	22.5	35	36	35	36	36	37	25	26	25	26	26	27	7
22.5D	2.5	88	91	90	92	91	94	63	65	64	66	66	68	37
22.5D	7.5	72	75	73	76	74	77	52	54	53	55	53	56	29
22.5D	12.5	51	53	52	54	53	55	36	38	37	39	38	39	22
22.5D	17.5	35	35	35	36	36	36	25	25	25	26	26	26	11
27.5D	2.5	48	47	49	48	50	49	34	34	35	34	36	35	26
27.5D	7.5	40	41	41	41	42	42	29	29	30	30	30	30	18

Luminous Intensity 6.4.4.1 through 6.4.4.4

Sample:	CRT2502170837-004-6	Target Input voltage	Measured Input Voltage	H, V Lum. Intensity	Vac Variation Factor	MMLI Factor
Module	12" Ball	80Vac	80.0 Vac	594.2 Candela	0.977	0.706
Color:	Red	120Vac	120.1 Vac	607.9 Candela	1.000	
Lens Type:	Clear	135Vac	135.1 Vac	616.2 Candela	1.014	

Photometric Test Distance: 25 meters

Max	1095	25°C		25°C		25°C		74°C/49°C		74°C/49°C		74°C/49°C		
Vertical	Horizontal	Rated 80Vac		Measured 120Vac		Rated 135Vac		Rated 80Vac		Measured 120Vac		Rated 135Vac		Table 1
Angle	Angle	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Candela	Minimum
Up/Down	Left/Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Candela
12.5U	2.5	100	100	102	103	103	104	70	71	72	72	73	73	37
12.5U	7.5	87	90	89	92	90	93	61	63	63	65	64	66	29
7.5U	2.5	167	170	171	174	174	177	118	120	121	123	122	125	69
7.5U	7.5	138	146	142	149	144	151	98	103	100	105	101	107	55
7.5U	12.5	100	108	102	110	103	112	70	76	72	78	73	79	40
2.5U	2.5	369	375	377	383	382	389	260	264	266	270	270	274	150
2.5U	7.5	300	317	307	324	311	328	212	223	217	229	220	232	124
2.5U	12.5	211	229	216	234	219	237	149	162	152	165	154	167	84
2.5U	17.5	130	141	133	144	135	146	92	99	94	101	95	103	47
2.5U	22.5	71	79	73	81	74	82	50	56	51	57	52	58	26
2.5D	2.5	774	788	792	806	802	817	546	556	558	569	566	576	358
2.5D	7.5	640	666	654	682	663	691	451	470	462	481	468	487	292
2.5D	12.5	458	483	469	494	475	501	323	341	331	348	335	353	201
2.5D	17.5	286	301	292	308	296	312	202	212	206	217	209	220	117
2.5D	22.5	156	167	159	171	161	173	110	118	112	121	114	122	62
2.5D	27.5	69	81	70	83	71	84	48	57	49	58	50	59	33
7.5D	2.5	663	665	679	680	688	690	468	469	479	480	485	487	281
7.5D	7.5	549	562	562	575	569	582	387	396	396	405	402	411	234
7.5D	12.5	389	403	398	412	403	418	274	284	281	291	285	295	157
7.5D	17.5	240	249	246	255	249	259	170	176	173	180	176	183	91
7.5D	22.5	132	139	135	142	137	144	93	98	96	100	97	102	47
7.5D	27.5	64	68	65	70	66	71	45	48	46	49	47	50	26
12.5D	2.5	255	256	261	262	265	266	180	181	184	185	187	187	110
12.5D	7.5	212	214	216	219	219	222	149	151	153	155	155	157	88
12.5D	12.5	148	153	151	156	153	158	104	108	107	110	108	112	62
12.5D	17.5	93	97	95	99	97	100	66	68	67	70	68	71	37
12.5D	22.5	54	57	55	58	56	59	38	40	39	41	40	42	18
12.5D	27.5	30	32	31	33	32	33	21	23	22	23	22	24	11
17.5D	2.5	124	124	126	127	128	129	87	88	89	90	90	91	51
17.5D	7.5	106	108	108	110	110	112	75	76	76	78	77	79	40
17.5D	12.5	78	80	80	82	81	83	55	57	57	58	57	59	29
17.5D	17.5	53	56	55	57	55	58	38	39	39	40	39	41	15
17.5D	22.5	36	38	37	39	37	39	26	27	26	27	26	28	7
22.5D	2.5	91	92	93	94	94	95	64	65	65	66	66	67	37
22.5D	7.5	75	75	77	76	77	77	53	53	54	54	55	55	29
22.5D	12.5	53	54	54	55	55	56	38	38	38	39	39	39	22
22.5D	17.5	36	37	37	38	37	39	25	26	26	27	26	27	11
27.5D	2.5	50	49	51	50	52	51	35	34	36	35	37	36	26
27.5D	7.5	42	43	43	44	43	44	29	30	30	31	31	31	18

Complies:	☒ YES	☐ NO
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Tested By:	Matthew Benninger	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Test Equipment Used:	20,21,22,23,25,26,27	Completion Date:	1-Apr-2025
Amb (°C):	19	RH%	38

Luminance Uniformity

Luminance measurements were taken at nine locations across the signal face. A spot size of one inch was used. The luminance meter was translated from side to side and up and down remaining normal to the sample surface. The measurements were used to determine luminance uniformity. The measurements were taken after operating on the same duty cycle used during the photometric test.

Results

The ratio between the maximum and the minimum luminance was less than 10 to 1. Data follows.

12" Red Ball Tinted			
Sample	CRT2502170837-004-1	CRT2502170837-004-2	CRT2502170837-004-3
Location	Luminance	Luminance	Luminance
1	12414	11709	12345
2	16851	17782	16300
3	16245	17648	19026
4	19071	16899	19395
5	9217	9766	11168
6	13529	14338	14030
7	18359	18536	19302
8	10273	9962	10591
9	6822	6123	6314
Average	13642	13640	14275
Intensity Ratio	2.8	3.0	3.1

12" Red Ball Clear			
Sample	CRT2502170837-004-4	CRT2502170837-004-5	CRT2502170837-004-6
Location	Luminance	Luminance	Luminance
1	12275	10629	12863
2	17020	15223	19980
3	17795	14717	15879
4	18119	14082	15745
5	10388	8046	9021
6	15579	15254	15159
7	19694	18301	19773
8	10755	9268	10093
9	6515	6425	6188
Average	14238	12438	13856
Intensity Ratio	3.0	2.8	3.2

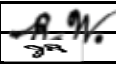
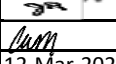
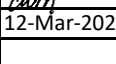
Luminance measurements are in cd/m2

Same 60 minute warm-up used for luminous intensity

Test distance is 19 feet with ¼ degree aperture using the PR 740

Measured Voltage: 120.0 - 120.3 Vac

Complies: ☒ YES ☐ NO

Tested By:	Rex Williams	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	3-6	Completion Date:	12-Mar-2025
Amb (°C):	25	RH%	11.9

Chromaticity 6.4.4.6

The chromaticity measurements were performed on the submitted LED Traffic Signal Modules with the spectroradiometer. The samples were operated at nominal input voltage and ambient temperature during the measurements. The measurements were taken from 380-780nm in 2nm increments.

The chromaticity measurements were taken at nine locations across the signal face. A spot size of one inch was used with the samples operating on the same duty cycle used during the photometric test. The spectro-radiometer was translated from side to side and up and down remaining normal to the sample surface. The average of the measurements are recorded.

Results

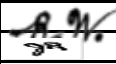
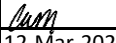
		Chromaticity Coordinates	
Color	Sample	x	y
Red (Tinted)	CRT2502170837-004-1	0.701	0.299
	CRT2502170837-004-2	0.701	0.299
	CRT2502170837-004-3	0.700	0.300

		Chromaticity Coordinates	
Color	Sample	x	y
Red (Clear)	CRT2502170837-004-4	0.699	0.300
	CRT2502170837-004-5	0.699	0.300
	CRT2502170837-004-6	0.700	0.300

The chromaticity measurements meet the requirements of the referenced specification.

Measured Voltage: 120.0 - 120.3 Vac

Complies: ☒ YES ☐ NO

Tested By:	Rex Williams	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	3-6	Completion Date:	12-Mar-2025
Amb (°C):	25	RH%	11.9

Color Uniformity 6.4.4.7

Three samples of each model were tested. Nine color measurements were taken at different locations on the traffic signal face. The measurements were taken after operating on the same duty cycle used during the photometric test.

Results

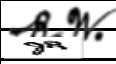
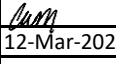
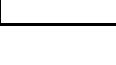
12" Red Ball Tinted									
Sample	CRT2502170837-004-1			CRT2502170837-004-2			CRT2502170837-004-3		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.701	0.299	626	0.701	0.299	625	0.700	0.299	625
2	0.701	0.299	625	0.701	0.299	625	0.700	0.300	625
3	0.701	0.299	625	0.701	0.299	625	0.700	0.300	625
4	0.701	0.299	626	0.701	0.299	625	0.700	0.300	625
5	0.701	0.299	626	0.701	0.299	625	0.700	0.299	625
6	0.701	0.299	626	0.701	0.299	625	0.700	0.299	625
7	0.701	0.299	626	0.701	0.299	625	0.700	0.299	625
8	0.701	0.299	625	0.700	0.299	625	0.700	0.300	625
9	0.700	0.299	625	0.700	0.299	625	0.700	0.300	625
Average	0.701	0.299	625	0.701	0.299	625	0.700	0.300	625

12" Red Ball Clear									
Sample	CRT2502170837-004-4			CRT2502170837-004-5			CRT2502170837-004-6		
Location	x	y	Dominant	x	y	Dominant	x	y	Dominant
1	0.699	0.300	625	0.699	0.300	625	0.700	0.300	625
2	0.699	0.300	625	0.699	0.301	624	0.700	0.300	625
3	0.699	0.300	624	0.699	0.301	624	0.700	0.300	625
4	0.699	0.300	625	0.699	0.300	624	0.700	0.300	625
5	0.700	0.300	625	0.699	0.300	625	0.700	0.300	625
6	0.700	0.300	625	0.699	0.300	624	0.700	0.300	625
7	0.700	0.300	625	0.699	0.300	625	0.700	0.300	625
8	0.699	0.301	624	0.699	0.301	624	0.699	0.300	625
9	0.699	0.301	624	0.699	0.301	624	0.699	0.301	624
Average	0.699	0.300	625	0.699	0.300	624	0.700	0.300	625

The color uniformity measurements meet the requirements of the referenced specification.

Measured Voltage: 120.0 - 120.3 Vac

Complies: ☒ YES ☐ NO

Tested By:	Rex Williams	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	3-6	Completion Date:	12-Mar-2025
Amb (°C):	25	RH%	11.9

Lens Abrasion Resistance 6.4.5.2

A lens was mounted in the abrasion test fixture with the lens facing upwards. An abrading pad was cycled back and forth (1 cycle) for twelve cycles at $10\text{cm} \pm 2\text{cm}$ per second over the test surface of the lens. The abrading pad shall not be less than $2.5\text{cm} \pm 0.1\text{cm}$ square, constructed of 0000 steel wool rubber cemented to a rigid base shaped to the contour of the lens. The "grain" of the pad was perpendicular to the direction of motion. The abrading pad support was equal in size to the pad and the center of the support surface was within $\pm 2\text{mm}$ of parallel to the lens surface. The density of the abrading pad was such that when the pad was mounted to its support and is resting unweight on the lens, the base of the pad was no closer than 3.2mm to the lens at its closest point. When mounted on its support and resting on the lens, the abrading pad was weighted such that a pad pressure of $14\text{kPa} \pm 1\text{kPa}$ exists at the center and perpendicular to the face of the lens. A pivot was used to follow the contour of the lens.

Results

A single intensity point was measured before and after the abrasion. In all samples tested the abraded lens intensity measurement was at least 90% of the un-abraded lens intensity measurement.

12" Red Ball Tinted			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2502170837-004-1	583.1	571.1	0.98
CRT2502170837-004-2	583.2	559.4	0.96
CRT2502170837-004-3	581.5	570.8	0.98

measurements in cd

12" Red Ball Clear			
Sample	Pre Abrasion	Post Abrasion	Percentage
CRT2502170837-004-4	592.5	577.6	0.97
CRT2502170837-004-5	609.2	582.7	0.96
CRT2502170837-004-6	607.9	592.8	0.98

measurements in cd

Measured Voltage:	120.03	Vac		
Measured Weight:	8	lbs		
Abrasion Pad	4	Sq. In		
Pad Pressure	2.1	psi	14.5	Kpa

Complies: ☒ YES ☐ NO

Tested By:	Matthew Benninger	Signature or initials:	<i>MB</i>
Engineer:	John Robins	Signature or initials:	<i>JR</i>
Reviewed By:	cwm	Signature or initials:	<i>cwm</i>
Equipment Used:	20,21,22,23,24	Completion Date:	2-Apr-2025
Amb (°C):	19	RH%	42

Current Consumption 6.4.6.1

Three samples were measured for current flow in amperes. The measured current values are supplied for comparison of Product Quality Assurance current measurements on production modules. Current measurements were taken at start up.

Results

Measurements are in (mA)

12" Red Ball			
Sample	-40°C	25°C	74°C
CRT2502170837-004-1	58.8	56.9	68.5
CRT2502170837-004-2	59.4	58.2	70.1
CRT2502170837-004-3	58.7	56.9	68.5

Label lists 7.4VA

The current consumption was not in excess of 120% of the design qualification current values for an ambient temperature of 25°C.

Measured Voltage:	120.0 - 120.3	Vac
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Complies: ☒ YES ☐ NO

Tested By:	John Robins	Signature or initials:	
Engineer:	John Robins	Signature or initials:	
Reviewed By:	cwm	Signature or initials:	
Equipment Used:	1,7,9	Completion Date:	27-Mar-2025
Amb (°C):	NA	RH%	NA

Power Factor & Total Harmonic Distortion 6.4.6.6 & 6.4.6.7

Three tinted samples were measured for power factor and total harmonic distortion. A commercially available power analyzer was used to perform these measurements.

Results

12" Red Ball						
Sample	Voltage	Current (mA)	Power (W)	Power Factor	THD V%	THD I%
CRT2502170837-004-1	120.0	59.4	7.0	0.98	1.32	7.2
CRT2502170837-004-2	120.0	61.1	7.2	0.98	1.25	7.3
CRT2502170837-004-3	120.0	59.5	7.0	0.98	1.25	7.3
Requirement	NA	NA	NA	≥ 0.90	≤ 20%	≤ 20%

Measurements taken after a minimum 60 minute warmup.

Complies: ☒ YES ☐ NO

Tested By:	John Robins			Signature or initials:	
Engineer:	John Robins			Signature or initials:	
Reviewed By:	cwm			Signature or initials:	
Equipment Used:	7,8,9			Completion Date:	24-Mar-2025
Amb (°C):	24.6	RH%	21.9		

Equipment list					
#	Intertek ID No.		Description	Manufacturer	Calibration Due
1	H204		Thermal Chamber	Thermotron	12-Jun-2025
2	M207		Multimeter	Fluke	14-Oct-2025
3	O757		Spectra Scan PR740	Photo Research	30-Apr-2025
4	D589		Digital Multimeter	Fluke	22-Apr-2025
5	L282		Hygro-Thermometer	Testo	5-Apr-2025
6	L268		Tape Measure	Crescent	9-Dec-2027
7	A206		Current Transformer	Pearson	01-Jun-2025
8	L176		Thermometer	Testo	19-Jul-2025
9	M297		Power Analyzer	Yokogawa	29-May-2025
10	M359	--	Digit Hygro-Thermometer	Testo 608-H1	12-Aug-2025
11	V393	--	Shaker Controller	Unholtz-Dickie 100291109	28-May-2025
12	L195	CH1-4	Signal Conditioner	PCB Piezotronics 482C	25-Apr-2025
13	L221	CH1A	Accelerometer	PCB Piezotronics M35A60/ACS	29-Jan-2026
14	L222	CH2A	Accelerometer	PCB Piezotronics M35A60/ACS	29-Jan-2026
15	L224		IR Thermomter	Fluke	10-Oct-2025
16	T1319		Thermometer	Fluke	30-Jul-2025
17	N1154		Rain Gauge	Cole Parmer	14-Feb-2026
18	Y255		Anemometer	Pacer Instruments	20-Sep-2025
19	M296		Stopwatch	Traceable	22-Jan-2026
20	O109		Goniometer	Optroniks	04-Mar-2026
21	L235		25M Photocell	Instrument Systems	17-Apr-2025
22	L254		Hygrometer	Testo	03-Jun-2025
23	O091		Power Analyzer	Yokogawa	11-Jun-2025
24	F363A		Push Pull Meter	Imada	08-May-2025
25	H138		Thermal Chamber	Despatch	Used with cal'd Equip.
26	T1546		Digital Thermometer	Dickson	09-May-2025
27	O756		Flex Optometer	UDT	29-Mar-2025

Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files.